

(12)特許協力条約に基づいて公開された国際出願

(19) 世界知的所有権機関  
国際事務局(43) 国際公開日  
2003 年 12 月 24 日 (24.12.2003)

PCT

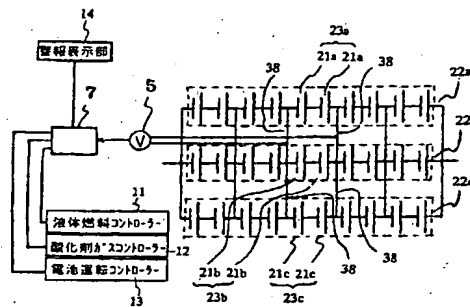
(10) 国際公開番号  
WO 03/107466 A1

- (51) 国際特許分類: H01M 8/04, 8/10, 8/24
- (21) 国際出願番号: PCT/JP03/07622
- (22) 国際出願日: 2003 年 6 月 16 日 (16.06.2003)
- (25) 国際出願の言語: 日本語
- (26) 国際公開の言語: 日本語
- (30) 優先権データ:  
特願2002-176303 2002 年 6 月 17 日 (17.06.2002) JP  
特願2002-189362 2002 年 6 月 28 日 (28.06.2002) JP
- (71) 出願人 (米国を除く全ての指定国について): 株式会社  
ユアサコーポレーション (YUASA CORPORATION)  
[JP/JP]; 〒569-1115 大阪府 高槻市 古曽部町二丁目  
3 番 2 1 号 Osaka (JP).
- (72) 発明者; および
- (75) 発明者/出願人 (米国についてのみ): 奥山 良一  
(OKUYAMA, Ryoichi) [JP/JP]; 〒569-1126 大阪府
- (74) 代理人: 塩入 明, 外 (SHIOIRI, Akira et al.); 〒659-0093 兵庫県 芦屋市 船戸町 4 番 1-4 0 9 号室 Hyogo (JP).
- (81) 指定国 (国内): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) 指定国 (広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM,

[続葉有]

(54) Title: LIQUID-FUEL FUEL CELL, OPERATION MONITORING METHOD FOR MONITORING OPERATION THEREOF, AND OPERATION MONITORING DEVICE

(54) 発明の名称: 液体燃料形燃料電池とその運転を監視する運転監視方法および運転監視装置



14...ALARM INDICATION UNIT 12...OXIDIZER GAS CONTROLLER  
11...LIQUID FUEL CONTROLLER 13...CELL OPERATION CONTROLLER

(57) Abstract: A liquid-fuel fuel cell comprising a unit cell that has a structure in which a negative electrode and a positive electrode are opposed with a polymer electrolyte having a proton conductivity interposed between them, a liquid fuel is supplied to the negative electrode, and air is supplied to the positive electrode, or the liquid-fuel cell comprising a cell stack where unit cells are stacked, an operation monitoring method for monitoring the operation, and an operation monitoring device are disclosed. The inventors has found out a degradation phenomenon of such a liquid-fuel fuel cell in which the exhausted fuel on the negative electrode side blackens and the cell performance irreversibly degrades if the output current is excessively increased, or if the supply of air or liquid fuel is insufficient. According to the invention, to prevent such degradation phenomenon, the liquid-fuel fuel cell has at least one of functions of increasing the supply of air or liquid fuel, issuing an alarm, decreasing the output current, and stopping the operation of the fuel cell when it is detected that the potential between the negative and positive electrodes monitored for at least one cell is below a predetermined negative potential.

[続葉有]

WO 03/107466 A1

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/07622

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> H01M8/04, H01M8/10, H01M8/24

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> H01M8/04, H01M8/10, H01M8/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2003
Kokai Jitsuyo Shinan Koho	1971-2003	Jitsuyo Shinan Toroku Koho	1996-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 97/21256 A1 (CALIFORNIA INSTITUTE OF TECHNOLOGY), 12 June, 1997 (12.06.97), Whole document; Figure 1 to 12 & JP 11-510311 A & JP 2002-110177 A & JP 2002-110197 A & JP 2002-110199 A & JP 2002-117863 A & JP 2002-117864 A	1, 4-7, 2-3
Y	EP 1134830 A2 (SAMSUNG ELECTRONICS CO., LTD.), 19 September, 2001 (19.09.01), Whole document; Figs. 1 to 13 & JP 2001-283892 A & US 2002/0076597 A1	1, 4-7, 2-3
Y	WO 02/07242 A2 (THE JOHNS HOPKINS UNIVERSITY), 24 January, 2002 (24.01.02), Whole document; Figs. 1 to 10 (Family: none)	1, 4-7, 2-3

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
16 September, 2003 (16.09.03)

Date of mailing of the international search report  
30 September, 2003 (30.09.03)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/07622

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2002-151134 A (Sony Corp.), 24 May, 2002 (24.05.02), Full text; Figs. 1 to 9 (Family: none)	1, 4-7, 2-3
Y	EP 0982788 A2 (GENERAL MOTORS CORP.), 01 March, 2000 (01.03.00), Claims; drawings & JP 2000-67896 A	1, 4-7, 3
Y	EP 1069636 A2 (General Motors Corp.), 17 January, 2001 (17.01.01), Whole document; Figs. 1 to 5 & JP 2001-43880 A & US 2002/0051899 A1	1, 4-7, 3
Y	JP 2002-8702 A (Idemitsu Kosan Co., Ltd.), 11 January, 2002 (11.01.02), Full text; Figs. 1 to 2 (Family: none)	1, 4-7, 3
Y	JP 64-76682 A (Mitsubishi Electric Corp.), 22 March, 1989 (22.03.89), Full text; Figs. 1 to 2 (Family: none)	2-3
A	JP 2000-268836 A (Sony Corp.), 29 September, 2000 (29.09.00), (Family: none)	1, 4-7
P, A	DE 10161234 A1 (Plug Power, L.L.C.), 11 July, 2002 (11.07.02), & US 2002/0081466 A1 & JP 2002-289240 A	1, 4-7
A	EP 0055016 A1 (WESTINGHOUSE ELECTRIC CORP.), 30 June, 1982 (30.06.82), & JP 57-130381 A & US 4490444 A	2-3
A	DE 10042210 A1 (SOFCo), 29 March, 2001 (29.03.01), & JP 2001-85041 A & US 6368739 B1	2-3